

1. A deoiler capable of communicating with a source of air contaminated with oil, comprising:

5       at least one separator for separating the oil from the air; and

      a source of suction for reducing pressure at the source of the contaminated air.

10      2. The deoiler of claim 1 wherein the deoiler creates the suction when operating at a first operating condition and acts as a restrictor when operating at a second operating condition.

15      3. The deoiler of claim 2 wherein the first operating condition is a lower range of speeds and the second operating condition is a higher range of speeds.

20      4. The deoiler of claim 1 including a compressor for recompressing the air.

25      5. The deoiler of claim 4 wherein the compressor includes an inlet, a stage of compressor blades and an outlet, and the separator comprises at least one of:

      i) a compressor inlet oil separator including a collection surface and a recovery passage at the compressor inlet; and

      ii) a compressor outlet oil separator including a collection surface and a recovery passage at the compressor outlet.

6. The deoiler of claim 5, comprising:

a plenum for receiving air discharged from the compressor, the plenum bounded in part by a plenum seal;

5 teeth; and

wherein the compressor outlet recovery passage extends past the plenum seal.

7. The deoiler of claim 5 comprising an auxiliary

10 separator.

8. The deoiler of claim 7 wherein the auxiliary separator includes a set of paddles.

15 9. The deoiler of claim 7 wherein the auxiliary separator resides upstream of the oil collection surfaces at the compressor inlet and outlet.

10. The deoiler of claim 4 comprising a stator stage  
20 downstream of the compressor for capturing decontaminated air.

11. The deoiler of claim 10 wherein the stator stage includes an array of stator vanes separated by intervane  
25 passages each having an inlet and an outlet, each passage increasing in area from its inlet to its outlet.

12. The deoiler of claim 10 wherein the stator stage includes an array of stator vanes separated by intervane  
30 passages each having an inlet, an outlet and a meanline, each meanline forming a nonzero angle with respect to a radial line that intersects the meanline at the passage inlet.

13. The deoiler of claim 12 wherein the nonzero angle is about 70 degrees.

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14. The deoiler of claim 1 wherein the air source is a bearing compartment.

15. A deoiler for receiving contaminated air from a compartment segregated from its surroundings by an imperfect seal and for separating the oil therefrom;

10 the deoiler being operable at a first operating condition in which it suctions the contaminated air from the compartment thereby establishing a positive pressure difference across the imperfect seal; and

15 the deoiler also being operable at a second operating condition in which it acts as a restriction, thereby pressurizing the compartment.

20 16. A lubrication system that provides oil to a compartment segregated from its surroundings by an imperfect seal, comprising:

25 a lubricant supply subsystem for introducing lubricant into the compartment;

30 a buffering subsystem for supplying buffer air to the vicinity of the seal outside the compartment; and

the deoiler of claim 15.

17. A deoiler for separating oil from air contaminated with 30 the oil, comprising:

an intake for admitting the air to the deoiler;  
a first separator comprising a paddlewheel and a deoiler outlet;

a compressor for receiving the air from the first separator, the compressor comprising a compressor inlet, a stage of blades and a compressor outlet;

5 a second separator comprising an array of teeth and an oil recovery passage at the compressor inlet;

a plenum for receiving air discharged from the compressor outlet, the plenum bounded in part by a plenum seal;

10 a third separator comprising an oil collection surface and an oil recovery passage that extends past the plenum seal; and

15 a stator stage downstream of the plenum for receiving decontaminated air from the plenum, the stator stage comprising an array of stator vanes separated by intervane passages each having an inlet, an outlet and a meanline, each meanline forming a nonzero angle with respect to a radial line that intersects the meanline at the passage inlet, and each passage increasing in area from its inlet to its outlet.

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**18.** A method of separating oil from a stream of air contaminated with the oil, the stream of air originating at a replenishable air source, comprising:

25 creating suction at a first operating condition thereby suctioning the stream of air from the air source and reducing air pressure at the source;

establishing a flow restriction at a second operating condition thereby pressurizing the air source while maintaining a flow of air from the source; and

30 encouraging the oil to separate from the air at both operating conditions.